

WHAT IS CLAIMED IS:

- 1 1. A method for modulating the immune response in a mammal to an antigen by
2 implanting within the body of said mammal a device comprising a porous matrix
3 contained within a perforated but otherwise impermeable container, said matrix
4 containing a quantity of said antigen, wherein said device attracts cells of the immune
5 system to encounter said antigen and to modulate said immune response.
- 1 2. The method of claim 1 wherein the antigen is bioavailable within said porous matrix at
2 the time of implantation of said device into said mammal.
- 1 3. The method of claim 1 wherein the antigen becomes bioavailable within said porous
2 matrix after the device has been implanted into said mammal..
- 1 4. The method of claim 3 wherein said antigen becomes bioavailable about three days
2 after implantation within said mammal.
- 1 5. The method of claim 1 wherein said antigen is introduced into said device about three
2 days after implantation.
- 1 6. The method of claim 1 wherein said antigen is provided in a delayed release
2 formulation.
- 1 7. The method of claim 1 wherein said porous matrix comprises a polymeric material.

- 1 8. The method of claim 7 wherein said polymeric material is selected from natural and
2 synthetic sources.
- 1 9. The method of claim 8 wherein said polymeric matrix is selected from the group
2 consisting of hydroxylated polyvinyl acetate, polyurethane, ethylene/vinyl acetate
3 copolymer, polylactic acid, polylactide-glycolide copolymer, gelatin, collagen, cross-
4 linked collagen, and combinations thereof.
- 1 10. The method of claim 1 wherein said container comprises a polymeric material selected
2 from natural and synthetic sources.
- 1 11. The method of claim 1 wherein the porous polymer matrix comprises hydroxylated
2 polyvinyl acetate and the container comprises a segment of perforated tubing.
- 1 12. The method of claim 1 wherein said quantity of antigen and the timing of the
2 bioavailability of said antigen within said device relative to the time of implantation of
3 said device into said mammal results in inducing or enhancing the immune response to
4 said antigen.
- 1 13. The method of claim 12 wherein said antigen is bioavailable within said device after
2 implantation of said device into said mammal.
- 1 14. The method of claim 13 wherein said antigen is introduced into said device about 2-4
2 days after the implantation of said device into said mammal.

- 1 15. The method of claim 1 wherein said quantity of antigen and the timing of the
2 bioavailability of said antigen within said device relative to the time of implantation of
3 said device into said mammal results in suppressing or down regulating an existing or
4 potential immune response to said antigen.
- 1 16. The method of claim 15 wherein said antigen is bioavailable within said device at the
2 time of implantation within said mammal.
- 1 17. The method of claim 1 wherein said device is removed from the body of said mammal
2 after a period of about 10 days.
- 1 18. The method of claim 1 wherein a second quantity of said antigen is reintroduced into
2 said device.
- 1 19. The method of claim 18 wherein said second quantity of said antigen is reintroduced
2 into said device by delayed release of said second quantity of said antigen present
3 within the device at the time of implantation.
- 1 20. An implantable device for modulating an immune response to an antigen comprising a
2 porous matrix contained within a perforated but otherwise impermeable container.
- 1 21. The device of claim 20 wherein said antigen is present within said porous matrix.
- 1 22. The device of claim 20 further comprising means for introducing said antigen into
2 contact with said porous matrix, either prior to or after implantation.

- 1 23. The device of claim 20 wherein said matrix comprises a polymeric material.
- 1 24. The device of claim 23 wherein said polymeric material is selected from natural and
2 synthetic sources.
- 1 25. The device of claim 24 wherein said polymeric material is selected from the group
2 consisting of hydroxylated polyvinyl acetate, ethylene/vinyl acetate copolymer,
3 polylactic acid, polylactide-glycolide copolymer, polyurethane, gelatin, collagen,
4 cross-linked collagen and combinations thereof.
- 1 26. The device of claim 20 wherein said container comprises a segment of perforated
2 tubing.
- 1 27. The device of claim 20 wherein said container comprises a perforated but otherwise
2 impermeable coating disposed around said porous matrix.
- 1 28. The device of claim 27 wherein said coating comprises a polymeric material.
- 1 29. The device of claim 28 wherein said polymeric material is selected from natural and
2 synthetic sources.
- 1 30. The device of claim 29 wherein said polymeric material is selected from the group
2 consisting of cross-linked collagen, polylactic acid, polylactide-glycolide copolymer,
3 polyethylene, silicone, latex resin, polystyrene, acrylic resin, polyvinylpyrrolidone, and

4 combinations thereof.

1 31. The device of claim 20 wherein the porous matrix comprises hydroxylated polyvinyl
2 acetate and the container comprises a segment of perforated tubing.

1 32. A method for obtaining immune cells from a mammal wherein said immune cells are
2 harvested from a device implanted in said mammal comprising a porous matrix
3 contained within a perforated but otherwise impermeable container.

1 33. The method of claim 32 wherein said harvested cells are reintroduced into said
2 mammal.

1 34. The method of claim 33 wherein said harvested cells are cryopreserved before
2 reintroduction into said mammal.

1 35. The method of claim 32 wherein an antigen is present within the porous matrix of said
2 device.

1 36. The method of claim 35 wherein said immune cells are reintroduced into said mammal.

1 37. The method of claim 35 wherein said immune cells are reintroduced into said mammal
2 after exposure to said antigen in vitro.

1 38. The device of claim 32 wherein said matrix comprises a polymeric material.

- 1 39. The device of claim 38 wherein said polymeric material is selected from natural and
2 synthetic sources.
- 1 40. The device of claim 39 wherein said polymeric material is selected from the group
2 consisting of hydroxylated polyvinyl acetate, ethylene/vinyl acetate copolymer,
3 polylactic acid, polylactide-glycolide copolymer, polyurethane, gelatin, collagen,
4 cross-linked collagen and combinations thereof.
- 1 41. The device of claim 32 wherein said container comprises a segment of perforated
2 tubing.
- 1 42. The device of claim 32 wherein said container comprises a perforated but otherwise
2 impermeable coating disposed around said porous matrix.
- 1 43. The device of claim 42 wherein said coating comprises a polymeric material.
- 1 44. The device of claim 43 wherein said polymeric material is selected from natural and
2 synthetic sources.
- 1 45. The device of claim 44 wherein said polymeric material is selected from the group
2 consisting of cross-linked collagen, polyethylene, silicone, latex resin, polystyrene,
3 acrylic resin, polylactic acid, polylactide-glycolide copolymer, polyvinylpyrrolidone,
4 and combinations thereof.
- 1 46. The device of claim 32 wherein the porous matrix comprises hydroxylated polyvinyl

2 acetate and the container comprises a segment of perforated tubing.

1 47. The method of claim 35 wherein said immune cells are used for the preparation of a
2 hybridoma for the production of a monoclonal antibody against said antigen.

1 48. A method of immunizing a mammal with an antigen for the preparation of a
2 hybridoma for the production of a monoclonal antibody against said antigen, wherein
3 the mammal is immunized using the method of claim 12.

1 49. A method of immunizing a mammal with an antigen for the preparation of a
2 hybridoma for the production of a monoclonal antibody against said antigen, wherein
3 the mammal is immunized using the device of claim 21.

1 50. The method of claim 12 wherein said immune response to said antigen is selected from
2 the group consisting of prophylactic vaccination, therapeutic vaccination, cellular
3 immunity, humoral immunity, mucosal immunity, long-term immunity, and
4 combinations thereof.

1 51. A method for the production of hybridomas producing human monoclonal antibodies
2 against a preselected antigen comprising the sequential steps of:

3 (a) introducing human peripheral blood lymphocytes into the circulation of
4 a severe combined immunodeficient (SCID) mouse and allowing said
5 lymphocytes to populate the immune system of said mouse;

6 (b) implanting in said mouse a device of claim 21, the antigen of said

7 device comprising said preselected antigen;
8 (c) harvesting immune cells from said device;
9 (d) preparing hybridomas from B lymphocytes present in said harvested
10 immune cells; and
11 (e) identifying by screening methodology those hybridomas that produce
12 monoclonal antibodies that recognize said preselected antigen.

1 52. A method for transfecting immune cells of a mammal with genetic material comprising
2 introducing said genetic material within the matrix of a device comprising a porous
3 matrix contained within a perforated but otherwise impermeable container, said device
4 implanted within the body of said mammal.

1 53. The method of claim 52 wherein said genetic material is selected from the group
2 consisting of DNA, RNA, and cDNA.

1 54. The method of claim 52 wherein said genetic material codes for an antigen.

2 55. A method for the treatment or prophylaxis of a disease or condition caused by an
3 immune response comprising suppressing said immune response in accordance with
4 claim 15.

5 56. The method of claim 55 wherein said disease or condition is selected from the group
6 consisting of allergies, transplant rejection, and autoimmune diseases.

7 57. A method for modulating the immune response in a mammal to an antigen by

8 implanting within the body of said mammal a device comprising said antigen and
9 further comprising means for limiting the passive diffusion of molecules out of said
10 device without limiting the active movement of immune cells into or out of said
11 device.